

Notes on Earth Science Content Specialization Courses

Coverage area recommendations

Our departmental guidelines (based on the standards of various national organizations concerned with science teacher education) specify the following major areas in which earth science teachers should ideally have coursework *beyond* an introductory geology sequence:

- meteorology
- astronomy
- oceanography
- mineralogy/petrology
- advanced historical geology
- advanced physical geology

Three of our required courses (GEOG 1112-1112L, ASTR 1010-1010L or 1020-1020L, and an oceanography course) cover the first three on this list (the other required courses are one of the introductory physical and historical geology sequences).

A typical Geology major's program to cover the others would be:

- GEOG 3010-3010L (4 hours)
- GEOG 4010-4010L (4 hours)
- GEOG 3020-3020L (4 hours)
- GEOG 4020-4020L (4 hours)

Taking all of these courses ("Category 1" below), in addition to the required courses, would be the most rigorous preparation in geology and would satisfy the full 35 hours allocated for content specialization, and they are always scheduled so as not to conflict with each other and to be able to be completed in one academic year (2 courses which may be taken concurrently during Fall, 2 more advanced courses during Spring).

There is reason to believe, however, that many of the Geology, Geography, and Astronomy courses designed to be accessible and of interest to non-majors ("Category 2" below) might be more directly relevant as background to a typical secondary earth science curriculum, despite not being systematically rigorous in geology as narrowly defined. A few students might also have both the interest and the prerequisites to take upper-level (4000+) courses in Geology, Astronomy, Geography, or Marine Science ("Category 3").

Therefore our requirement is a minimum of 13 hours of Earth Science electives (for a total of 32 earth science hours with the 5 required courses), with the strong suggestion to students and advisors to cover as many of the above areas as possible.

Taking 13 hours of Category 2 or 3 electives leaves 3 hours (of the 35 designated for Content Specialization) free for other science or science education electives. In order to provide the broadest possible scientific background for Earth Science teaching, we suggest that most students use this slot for an introductory Organismic Biology course, BIOL 1103 or 1107. The actual number of required hours in this category would be less if the student takes more than the minimum 13 hours of Earth Science electives.

Required (19 hours):

1. GEOG 1121-1121L. Earth Processes and Environments. 4 hours.
Offered fall, spring, and summer semesters.
OR
GEOG 1250-1250L. Physical Geology. 4 hours.
Offered fall and spring semesters.
2. GEOG 1122-1122L. Earth's History of Global Change. 4 hours.
Offered fall, spring, and summer semesters.
OR
GEOG 1260-1260L. Historical Geology. 4 hours.
Offered fall and spring semesters.
3. GEOG 1112-1112L. Introduction to Weather and Climate. 4 hours.
Offered fall, spring, and summer semesters.

4. ASTR 1010-1010L. Astronomy of the Solar System. 4 hours.
Offered fall and spring semesters.

OR

ASTR 1020-1020L. Stellar and Galactic Astronomy. 4 hours.
Offered fall and spring semesters.

5. GEOL 3030. Elementary Oceanography. 3 hours.
Offered spring semester.

OR

GEOL 4090/6090. Marine Geology. 3 hours.
Prerequisite: GEOL 1260-1260L.
Offered spring semester.

OR

MARS 4100/6100. General Oceanography I. 3 hours.
Offered fall and spring semesters.

Earth Science Electives (choose a total of at least 13 hours):

(“Category 1”: 4-hour, mid-level “core” courses intended primarily for Geology Department majors)

GEOL 3010-3010L. Earth Materials. 4 hours.
Offered fall semester.

GEOL 3020-3020L. Surficial and Near-Surficial Processes. 4 hours.
Offered spring semester.

GEOL 4010-4010L. Life, Environment, and Ecologies of the Past. 4 hours.
Prerequisite or corequisite: GEOL 3010-3010L.
Offered fall semester.

GEOL 4020-4020L. Internal Earth Processes. 4 hours.
Prerequisite: GEOL 3010-3010L.
Offered spring semester.

(“Category 2”: mid-level courses, most 3 hours, with no or minimal prerequisites)

GEOL 2120. Introduction to Environmental Geology. 3 hours.
Offered spring semester.

GEOL 3090. Gems and Gem Materials. 3 hours.
Offered fall semester.

GEOL 3080. Volcanoes of the Puna Plateau. 1 hour.
Non-traditional format: Course will be field-based only, and will be offered as an optional extension of the Geology Study
Abroad Program in Argentina.
Offered summer semester every odd-numbered year.

GEOL 3100. Geology of Argentina. 3 hours.
Non-traditional format: Course may be taught during Summer Session, in the field, as part of the Geology in Argentina
Study Abroad Program.
Offered summer semester every odd-numbered year.

GEOL 3120-3120L. Geological Hazards. 3 hours.
Offered fall semester of even-numbered years.

GEOL 3130. Geology of the National Parks. 3 hours.
Offered spring semester.

GEOL 3140-3140L. Geology and Exploration of the Moon. 3 hours.

GEOL 3150. Coastal Processes and Conservation. 3 hours.

Offered fall semester of odd-numbered years.

GEOL 3200. Rocks and Minerals. 3 hours.

Non-traditional format: Field trips required. Many of the lectures will be delivered on site during field trips.

Offered summer semester of odd-numbered years.

GEOL 3220. Water Issues in Georgia. 3 hours.

Non-traditional format: A critical part of the learning process is from field trips and therefore they will be required. These field trips will be undertaken during the normal class period. An optional one-day field trip will be offered on one weekend, outside of the normal class period. Extra credit (10% of grade) will be awarded for participation in this trip.

Offered fall semester.

GEOL 3250. Earth Resources and the Environment. 3 hours.

Offered fall semester of even-numbered years.

GEOL 3300. Paleobiotas. 3 hours.

Offered spring semester of odd-numbered years.

GEOL 3350. Dinosaurs - Lifestyles of the Big and Famous in the Mesozoic. 3 hours.

Offered spring semester.

GEOL 3400. Geological Evolution of North America. 3 hours.

Non-traditional format: At least one weekend field trip.

Offered fall semester of odd-numbered years.

ASTR 1420. Life in the Universe. 3 hours.

Offered fall semester of even-numbered years.

ASTR 1540. Science, Science Fiction, and Pseudoscience. 3 hours.

Offered spring semester of odd-numbered year.

ASTR 1660. History of Astronomy. 3 hours.

Offered fall semester of odd-numbered years.

ASTR 1870. Black Holes. 3 hours.

Offered spring semester of even-numbered years.

ASTR 2030L. Introduction to Astronomical Observations. 1 hour.

Non-traditional format: Students will spend ten hours at the telescope and twenty hours in data reduction .

Offered fall and spring semesters.

ASTR 3010. Astronomical Observations and Techniques I. 3 hours.

Prerequisite: ASTR 1020 and ASTR 1020L.

Offered fall semester of even-numbered years.

ASTR 3020. Astronomical Observations and Techniques II. 3 hours.

Prerequisite: ASTR 3010.

Offered spring semester of odd-numbered years.

GEOG 3010. General Geomorphology. 3 hours.

Offered fall and spring semesters.

GEOG 3110. Climatology. 3 hours.

Offered fall and spring semesters.

GEOG 3210. Biogeography. 3 hours.

Offered fall and spring semesters.